# Coverage Summary

## Cardiovascular Diagnostic Procedures

<table>
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<tr>
<td>Approved by:</td>
<td>UnitedHealthcare Medicare Benefit Interpretation Committee</td>
<td>Last Review Date: 01/17/2017</td>
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</tbody>
</table>

**Related Medicare Advantage Policy Guidelines:**

- Ambulatory Blood Pressure Monitoring (NCD 20.19)
- Cardiac Output Monitoring by Thoracic Electrical Bioimpedance (TEB) (NCD 20.16)
- Cardiointegram (CIG) as an Alternative to Stress Test or Thallium Stress Test (NCD 20.27)
- Diagnostic Endocardial Electrical Stimulation (Pacing) (NCD 20.12)
- Digital Subtraction Angiography (NCD 220.9)
- Displacement Cardiography (NCD 20.24)
- Electrocardiographic Services (NCD 20.15)
- External Electrocardiographic Recording
- HIS Bundle Study (NCD 20.13)
- Microvolt T-Wave Alternans (MTWA) (NCD 20.30)
- Noninvasive Tests of Carotid Function (NCD 20.17)
- Percutaneous Coronary Interventions
- Plethysmography (NCD 20.14)

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The benefit information in this Coverage Summary is based on existing national coverage policy, however, Local Coverage Determinations (LCDs) may exist and compliance with these policies is required where applicable.

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   3. Digoxin Therapeutic Drug Assay
   4. Electrocardiographic (EKG) Services
   5. HIS Bundle Study
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II. **DEFINITIONS**

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I. COVERAGE

Coverage Statement: Cardiovascular diagnostic procedures are covered when Medicare coverage criteria are met.

Guidelines/Notes:

The following is not an all inclusive list of cardiac diagnostic procedures, but reflects diagnostic procedures based on the National Coverage Determinations (NCDs) listed below.

1. **Diagnostic Endocardial Electrical Stimulation (EES)**

   Diagnostic endocardial electrical stimulation involves the detection and stimulation of cardiac electrical activity for the purpose of studying arrhythmias and abnormalities of the heart's conduction system. Intracardiac electrode catheters, intracardiac and extracardiac recordings and a stimulator device are required. From two to six multipolar electrode catheters are inserted percutaneously, usually through the femoral veins, and advanced to the heart under fluoroscopic control. Other venous or arterial routes may be employed as well. An intracardiac His bundle cardiogram is usually obtained during EES as are conventional electrocardiograms.

   Diagnostic endocardial electrical stimulation is covered when used for patients with severe cardiac arrhythmias; also known as programmed electrical stimulation of the heart. An intracardiac HIS bundle cardiogram is usually obtained during EES as are conventional electrocardiograms. No separate charge will be recognized for the HIS bundle cardiogram. See the NCD for Diagnostic Endocardial Electrical Stimulation (Pacing) (20.12). (Accessed January 3, 2017)

2. **Digital Subtraction Angiography (DSA)**

   Digital subtraction angiography is a diagnostic imaging technique that applies computer technology to fluoroscopy for the purpose of visualizing the same vascular structures observable with conventional angiography. Since the radiographic contrast material can be injected into a vein rather than an artery, the procedure reduces the risk to patients, and can be done on an outpatient basis.

   Digital subtraction angiography is covered the same as conventional angiography. Payment for DSA should not exceed, and may be less than, that being paid for conventional angiographic techniques. See the NCD for Digital Subtraction Angiography (220.9). (Accessed January 3, 2017)

3. **Digoxin Therapeutic Drug Assay**

   Digoxin therapeutic drug assay is covered to monitor drug levels of individuals receiving digoxin therapy because the margin of safety between side effects and toxicity is narrow or because the blood level may not be high enough to achieve the desired clinical effect. For specific indications, see the NCD for Digoxin Therapeutic Drug Assay (190.24). (Accessed January 3, 2017)

4. **Electrocardiographic (EKG) Services**
EKG services, including Electrocardiogram Ambulatory Electrocardiography (AECG) (Holter monitor or Real-time EKG), Cardiac Event Monitor or Event Recorders are covered when specific criteria are met. See the NCD for Electrocardiographic Services (20.15) (Accessed January 3, 2017)

Local Coverage Determinations (LCDs) exist and compliance with these policies is required where applicable. See the following LCDs at http://www.cms.gov/medicare-coverage-database/overview-and-quick-search.aspx.

- Cardiac Event Detection
- Cardiac Event Detection Monitoring
- Category III Codes
- Electrocardiograms
- Electrocardiography
- Non-covered Services
- Real-Time, Outpatient Cardiac Telemetry
- Electrocardiographic (EKG or ECG) Monitoring (Holter or Real-Time Monitoring)
- Long Term Wearable Electrocardiographic Monitoring (WEM)

5. HIS Bundle Study

HIS bundle study is a specialized type of electrocardiography requiring catheterization of the right side of the heart and is a recognized diagnostic procedure.

HIS Bundle Study is covered for selected patients. For specific indications, see the NCD for HIS Bundle Study (20.13). (Accessed January 3, 2017)

Note: When a HIS bundle cardiogram is obtained as part of a diagnostic endocardial electrical stimulation, no separate charge will be recognized for the HIS bundle study.

6. Cardiac catheterization performed other than a hospital setting

Cardiac catheterization performed other than a hospital setting is a covered service. The procedure may also be covered when performed in a freestanding clinic when the carrier, in consultation with the appropriate Peer Review Organization (PRO), determines that the procedure can be performed safely in all respects in the particular facility.

Note: CMS repealed the NCD for Cardiac Catheterization Performed in Other than a Hospital Setting (20.25) effective January 12, 2006. (Accessed January 3, 2017)

In the absence of an NCD, local Medicare Contractors, UnitedHealthcare Medicare Advantage can determine whether a cardiac catheterization performed in a freestanding facility is reasonable and necessary.

7. Thoracic Electrical Bioimpedance (TEB)

Thoracic electrical bioimpedance devices is a form of plethysmography, monitor cardiac output by non-invasively measuring hemodynamic parameters, including: stroke volume, systemic vascular resistance, and thoracic fluid status.

TEB devices are covered when specific patient criteria are met. See the NCD for Cardiac Output Monitoring by Thoracic Electrical Bioimpedance (20.16). (Accessed January 3, 2017)

8. Displacement Cardiography (including Cardiokymography and Photokymography)
Displacement cardiography, including cardiokymography and photokymography, is a noninvasive diagnostic test used in evaluating coronary artery disease.

a) Cardiokymography is a **covered service** only when it is used as an adjunct to electrocardiographic stress testing in evaluating coronary artery disease and only when the following clinical indications are present:
   - For male patients, atypical angina pectoris or nonischemic chest pain; or
   - For female patients, angina, either typical or atypical

b) Photokymography is **not covered**.

*See the NCD for Displacement Cardiography (20.24). (Accessed January 11, 2017)*


9. **Cardiointegram (CIG)**

Cardiointegram device consists of a microcomputer which receives output from a standard electrocardiogram (EKG) and transforms it to produce a graphic representation of heart electrophysiologic signals. This procedure is used primarily as a substitute for Exercise Tolerance Testing with Thallium Imaging in patients for whom a resting EKG may be inadequate to identify changes compatible with coronary artery disease.

CIG is **not a covered** benefit as it is considered by Medicare as investigational. *See the NCD for Cardiointegram (CIG) as an Alternative to Stress Test or Thallium Stress Test (20.27). (Accessed January 11, 2017)*

10. **Ambulatory Blood Pressure Monitoring**

Ambulatory blood pressure monitoring is **covered** when criteria are met. *See the NCD for Ambulatory Blood Pressure Monitoring (20.19). (Accessed January 11, 2017)*

   Also see the Coverage Summary for Durable Medical Equipment (DME), Prosthetics, Corrective Appliances/Orthotics (Non-Foot Orthotics) and Medical Supplies Grid.

11. **Non-invasive Test of Carotid Function (Direct and Indirect)**

Refer to the Coverage Summary for Carotid Procedures and Testing.

12. **Plethysmography**

Plethysmography involves the measurement and recording (by one of several methods) of changes in the size of a body part as modified by the circulation of blood in that part. Plethysmography is of value as a noninvasive technique for diagnostic, preoperative and postoperative evaluation of peripheral artery disease in the internal medicine or vascular surgery practice. It is also a useful tool for the preoperative podiatric evaluation of the diabetic patient or one who has intermittent claudication or other signs or symptoms indicative of peripheral vascular disease which have a bearing on the patient's candidacy for foot surgery.

Plethysmography is **covered** when Category I tests criteria are met. Category II tests are considered experimental and therefore, not covered. *See the NCD for Plethysmography (20.14). (Accessed January 11, 2017)*

Local Coverage Determinations (LCDs) exist and compliance with these policies is required where applicable. *See the following LCDs at [http://www.cms.gov/medicare-coverage-](http://www.cms.gov/medicare-coverage-)*
13. Microvolt T-wave Alternans

A non-invasive diagnostic test that detects minute electrical activity in a portion of the electrocardiogram (EKG) known as the T-wave. The test is performed by placing highly sensitive electrodes on a patient's chest prior to a period of controlled exercise. These electrodes detect tiny beat-to-beat changes, on the order of one-millionth of volt, in the EKG T-wave. Spectral analysis is used to calculate these minute voltage changes. Spectral analysis is a sensitive mathematical method of measuring and comparing time and the EKG signals. Software then analyzes these microvolt changes and produces a report to be interpreted by a physician.

Microvolt T-wave Alternans diagnostic testing is covered for the evaluation of patients at risk for SCD, only when the spectral analysis method is used.

Microvolt T-wave Alternans diagnostic testing is not covered for the evaluation of patients at risk for SCD if measurement is not performed employing the spectral analysis.

Note: MTWA testing has a role in the risk stratification of patients who may be at risk for sudden cardiac death (SCD) from ventricular arrhythmias. Within patient groups that may be considered candidates for implantable cardioverter defibrillator (ICD) therapy, a negative MTWA test may be useful in identifying low-risk patients who are unlikely to benefit from, and who may experience worse outcomes from ICD placement.


NCD Update: On January 13, 2015, Centers for Medicare & Medicaid Services has decided that no National Coverage Determination (NCD) is appropriate at this time for microvolt T-wave alternans (MTWA) testing using the modified moving average (MMA) method for the evaluation of patients at risk for sudden cardiac death (SCD). National non-coverage will be removed. Medicare coverage of MTWA using the MMA method will be determined by the local contractors. The CMS final decision memo pertaining to this update is available at http://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=275. (Accessed January 11, 2017)

14. Intravascular Coronary Ultrasound (CPT codes 92978 and 92979)

- Medicare does not have a National Coverage Determination (NCD) for Intravascular Coronary Ultrasound.
- Local Coverage Determinations (LCDs) which address Intravascular Coronary Ultrasound exist and compliance with these LCDs is required where applicable. For state-specific LCDs, refer to the LCD Availability Grid (Attachment A).
- For states with no LCDs, refer to the MCG™ Care Guidelines, 20th edition, 2016 Intravascular Ultrasound (Coronary and Non-Coronary)ACG: A-0717 (AC) for information regarding medical necessity review. (IMPORTANT NOTE: After searching the Medicare Coverage Database, if no state LCD or Local Article is found, then use the above referenced policy)
II. DEFINITIONS

Diagnostic Services: A service is "diagnostic" if it is an examination or procedure to which the patient is subjected, or which is performed on materials derived from a hospital outpatient, to obtain information to aid in the assessment of a medical condition or the identification of a disease. Among these examinations and tests are diagnostic laboratory services such as hematology and chemistry, diagnostic x-rays, isotope studies, EKGs, pulmonary function studies, thyroid function tests, psychological tests, and other tests given to determine the nature and severity of an ailment or injury. See the Medicare Benefit Policy Manual, Chapter 6, §20.4.1 Diagnostic Services Defined. (Accessed August 8, 2017)

III. REFERENCES

See above

IV. REVISION HISTORY

01/17/2017 Annual review with the following update:
• Guideline 14 (Intravascular Coronary Ultrasound) – changed the default policy from Wisconsin Physicians LCD for Percutaneous Coronary Interventions (L34761) to MCG™ Care Guidelines, 20th edition, 2016 Intravascular Ultrasound (Coronary and Non-Coronary) ACG: A-0717 (AC).

01/19/2016 Annual review with the following update:
Updated reference link(s) of the applicable LCDs to reflect the new condensed LCD link(s).

03/12/2015 Formatting change only.

01/20/2015 Annual review with the following updates:
Guideline 1 [Diagnostic Endocardial Electrical Stimulation (EES)]
• Added the definition of diagnostic endocardial electrical stimulation (from the Definition section)
Guideline 2 [Digital Subtraction Angiography (DSA)]
• Added the definition of digital subtraction angiography (from the Definition section)
Guideline 5 (HIS Bundle Study)
• Added the definition of HIS bundle study (from the Definition section)
Guideline 7 [Thoracic Electrical Bioimpedance (TEB)]
• Added the definition of thoracic electrical bioimpedance (from the Definition section)
Guideline 8 (Displacement Cardiography)
• Added the definition of displacement cardiography (from the Definition section)
• Added reference link to the available Local Coverage Determinations
Guideline 9 (Cardiointegram)
• Added the definition of cardiointegram (from the Definition section)
Guideline 10 Ambulatory Blood Pressure Monitoring
- Added reference link to the Durable Medical Equipment (DME), Prosthetics, Corrective Appliances/Orthotics (Non-Foot Orthotics) and Medical Supplies Grid.

Guidelines 11 [Non-invasive Test of Carotid Function (Direct and Indirect)]
- Removed guideline in this Coverage Summary; added reference link to the Coverage Summary titled Carotid Procedures and Testing.

Guideline 12 (Plethysmography)
- Added definition of plethysmography (from the Definition section)

Guideline #13 (Microvolt T-wave Alternans)
- Added the definition of microvolt T-wave alternans (from the Definition section)

Guideline 14 (Intravascular Coronary Ultrasound)
- Changed the default guideline for states with no LCDs from National Government Services LCD for Cardiac Catheterization and Coronary Angiography (L26880 and L31829) to Wisconsin Physicians LCD for Percutaneous Coronary Interventions (L34139)

Definitions
- Moved to the Guideline section the definition of:
  - Cardiointegram
  - Displacement Cardiography
  - Diagnostic Endocardia Electrical Stimulation
  - Digital Subtraction Angiography (DSA)
  - HIS Bundle Study
  - Microvolt T-wave Alternans (MTWA) Testing
  - Plythysmography
  - Thoracic Electrical Bioimpedance (TEB)
- Removed the definition of:
  - Denervation (not used within this policy)
  - Transthoracic Echocardiography (not used within this policy)

02/18/2014 Annual review; no updates
02/19/2013 Annual review; no updates
02/27/2012 Annual review; Guidelines #14 Intravascular Coronary Ultrasound revised, i.e., the default LCD for states with no LCDs changed from Palmetto L28245 (retired) to NGS L26880 and CIGNA L31829.
06/30/2011 Added Guidelines #14 Intravascular Coronary Ultrasound; also added the definition of Diagnostic Services
02/21/2011 Annual review, no updates
08/27/2010 The link of the NCD for Microvolt T-Wave Alternans (20.30) was updated
## V. ATTACHMENT(S)

### Attachment A - LCD Availability Grid

**Intravascular Coronary Ultrasound**
(CPT codes 92978 and 92979)

CMS website accessed August 8, 2017

IMPORTANT NOTE: Use the applicable LCD based on member’s residence/place of service AND type of service.

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<tr>
<th>LCD ID</th>
<th>LCD Title</th>
<th>Contractor Type</th>
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<tbody>
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<td>L34761</td>
<td>Percutaneous Coronary Interventions</td>
<td>MAC - Part A</td>
<td>Wisconsin Physicians Service Insurance Corporation</td>
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End of Attachment A